National Aeronautics and Space Administration

NASAfacts

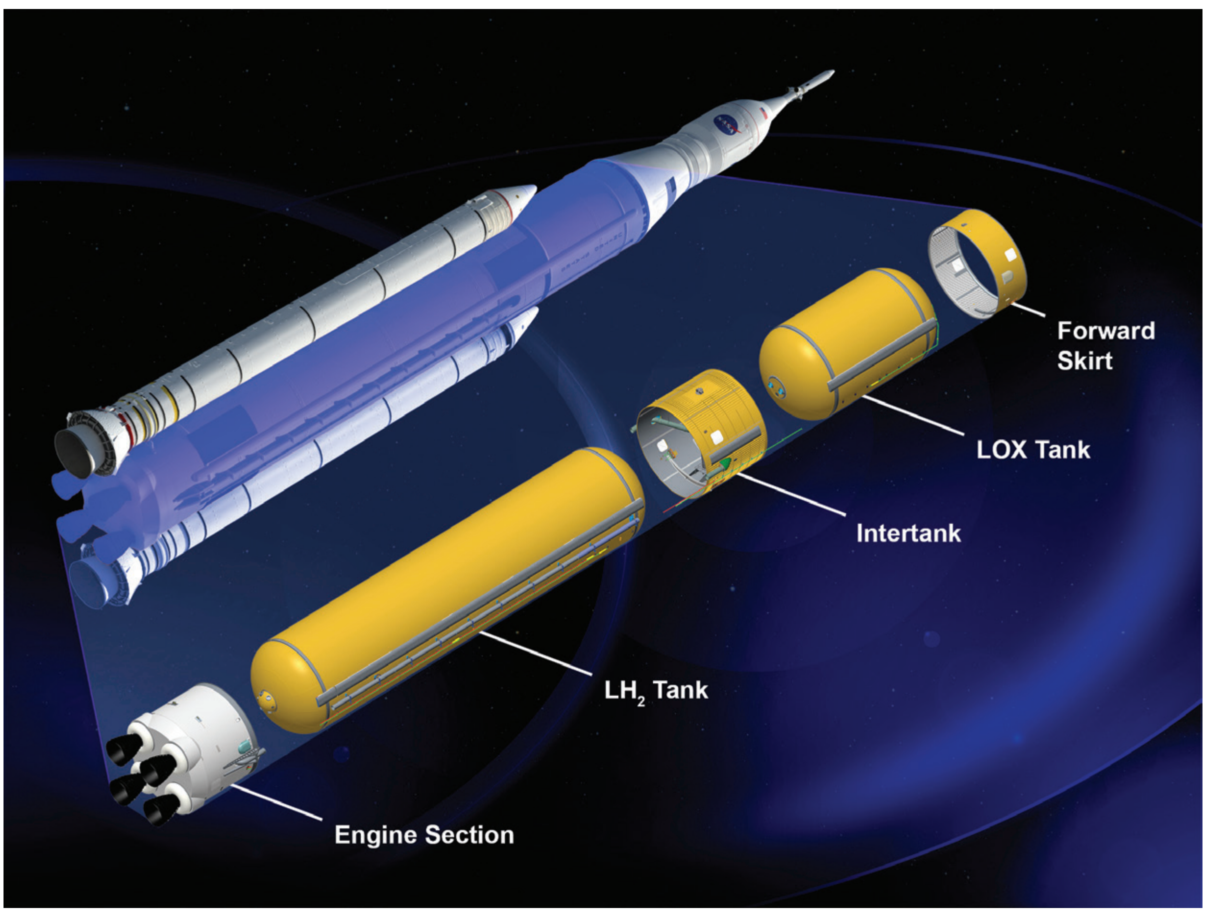
Space Launch System Core Stage

NASA's Space Launch System (SLS) core stage, towering more than 200 feet tall with a diameter of 27.6 feet, will store cryogenic liquid hydrogen and liquid oxygen that will feed the vehicle's RS-25 engines. SLS is an advanced, heavy-lift launch vehicle that will provide an entirely new capability for science and human exploration beyond Earth's orbit.

The core stage is being built at NASA's Michoud Assembly Facility in New Orleans using state-of-the-art manufacturing equipment. Michoud is a unique advanced manufacturing facility where NASA has built spacecraft components for decades — most recently, the space shuttle's external tanks.

The Boeing Company of Chicago is the prime contractor for the SLS core stage, including its avionics.

Propulsion for the SLS core stage will be provided by four RS-25 engines. The RS-25 engine design was previously designated the space shuttle main engine and is built by Aerojet Rocketdyne of Sacramento, Calif. As part of the Space Shuttle Program, these engines operated with 100 percent mission success during 135 missions. The SLS Program is adapting an inventory of 16 RS-25 flight engines, including the development of a new electronic engine controller based heavily on the recent development experience with the J-2X engine.



The B-2 test stand at NASA's Stennis Space Center in Mississippi — originally built to test Saturn rocket stages that propelled humans to the moon — is being completely renovated to test the massive SLS core stage in late 2016 and early 2017. The core stage will be installed on the stand for propellant fill and drain testing and two hot fire tests.

The core stage also will house the vehicle's avionics and flight computer. Flight computer software development is underway at NASA's Marshall Space Flight Center in Huntsville on engineering development units for the core stage. Developmental hardware and software early integration is also ongoing to mature rapidly and ensure implementation of safe, highly reliable avionics and software on SLS. All avionics components have completed their preliminary design review (PDR), and many have completed critical design review.

SLS's first flight test, which will feature a configuration for a 77-ton (70-metric-ton) lift capacity and carry an uncrewed Orion crew capsule beyond the moon, is scheduled for 2017. The SLS will evolve to a two-stage launch vehicle using the core stage and will provide a lift capability of 143 tons (130 metric tons) to enable more complex missions beyond low-Earth orbit and support deep-space exploration to an asteroid and Mars.

The core stage PDR was completed successfully in December 2012. The purpose of the PDR was to ensure the design met system requirements within acceptable risk and fell within schedule and budget constraints. An important part of the PDR was to prove the core stage could integrate safely with other elements of the rocket's main engines and solid rocket boosters, the crew capsule and the launch facilities at NASA's Kennedy Space Center in Florida.

Marshall manages the SLS Program for the agency. SLS will be the most powerful rocket in history and is designed to be flexible and evolvable to meet a variety of crew and cargo mission needs.

For more information on SLS, visit:

http://www.nasa.gov/sls/

http://www.twitter.com/NASA_SLS

http://www.facebook.com/NASASLS

Core Stage Facts

Length	Approximately 212 feet (64.6 meters)
Diameter	27.6 feet (8.4 meters)
Empty Weight	Approximately 188,000 lbs (85,275 kg)
Material	Aluminum 2219
Number of Engines	4 RS-25
Thrust per Engine:	512,000 lbs (232,242 kg)
Max Power Level (% Rated Power Level)	109% of the rated thrust
Fuel	Liquid hydrogen
Oxidizer	Liquid oxygen

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